



## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 39**

**[Docket No. FAA-2014-0523; Directorate Identifier 2014-NM-050-AD]**

**RIN 2120-AA64**

**Airworthiness Directives; The Boeing Company Airplanes**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Notice of proposed rulemaking (NPRM).

**SUMMARY:** We propose to adopt a new airworthiness directive (AD) for certain The Boeing Company Model 777-200 and -300 series airplanes equipped with Pratt and Whitney engines. This proposed AD was prompted by reports of blocked drain lines at the engine forward strut that caused flammable fluid to accumulate in a flammable leakage zone. This AD would require repetitive functional checks for blockage of the forward strut drain line, and doing corrective actions (including cleaning or replacing any blocked drain lines) if necessary; and a one-time cleaning of certain forward strut drain lines. We are proposing this AD to detect and correct blockage of forward strut drain lines, which could cause flammable fluids to collect in the forward strut area and potentially cause an uncontrolled fire or cause failure of engine attachment structure and consequent airplane loss.

**DATES:** We must receive comments on this proposed AD by **[INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

**ADDRESSES:** You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to <http://www.regulations.gov>. Follow the instructions for submitting comments.

- Fax: 202-493-2251.
- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.
- Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

For service information identified in this proposed AD, contact Boeing Commercial Airplanes, Attention: Data & Services Management, P. O. Box 3707, MC 2H-65, Seattle, WA 98124-2207; telephone 206-544-5000, extension 1; fax 206-766-5680; Internet <https://www.myboeingfleet.com>. You may view this referenced service information at the FAA, Transport Airplane Directorate, 1601 Lind Avenue SW., Renton, WA. For information on the availability of this material at the FAA, call 425-227-1221.

#### **Examining the AD Docket**

You may examine the AD docket on the Internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2014-0523; or in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this proposed AD, the regulatory evaluation, any comments received, and other information. The street address for the Docket Office (phone: 800-647-5527) is in the **ADDRESSES** section. Comments will be available in the AD docket shortly after receipt.

**FOR FURTHER INFORMATION CONTACT:** Kevin Nguyen, Aerospace Engineer, Propulsion Branch, ANM-140S, FAA, Seattle Aircraft Certification Office, 1601 Lind Avenue SW., Renton, WA 98057-3356; phone: 425-917-6501; fax: 425-917-6590; email: [kevin.nguyen@faa.gov](mailto:kevin.nguyen@faa.gov).

## **SUPPLEMENTARY INFORMATION:**

### **Comments Invited**

We invite you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under the **ADDRESSES** section. Include “Docket No. FAA-2014-0523; Directorate Identifier 2014-NM-050-AD” at the beginning of your comments. We specifically invite comments on the overall regulatory, economic, environmental, and energy aspects of this proposed AD. We will consider all comments received by the closing date and may amend this proposed AD because of those comments.

We will post all comments we receive, without change, to <http://www.regulations.gov>, including any personal information you provide. We will also post a report summarizing each substantive verbal contact we receive about this proposed AD.

### **Discussion**

We received more than five reports of the forward drain lines of the engine struts being blocked with coked particles. Coked particles form when hydraulic fluid is exposed to, and degraded by, the high temperatures of the hot core zone of the engine and the hot pneumatic bleed ducts. In two events, fluids backed up into the electrical (left) side of the disconnect box assembly of the strut system, causing an electrical fault that resulted in a false overheat detection engine indicating and crew-alerting system (EICAS) message. Flammable fluids collecting in the electrical side of the disconnect box assembly of the strut system can cause an electrical fault for electrical components, and create a potential ignition source for trapped flammable fluids that can lead to fuel explosion.

In the other three events, flammable fluids backed up and pooled in the fluid (right) side of the disconnect box assembly of the strut system. Flammable fluids collecting in the disconnect box assembly of the strut system are a fire hazard because

that area has no fire detection, containment, or extinguishing capability and with an ignition source can result in an uncontrolled fire in the strut. Also, flammable fluids pooling in the disconnect box assembly of the strut system can spill over onto the engine and initiate an engine fire in the engine core cavity compartment.

Hydraulic fluid collecting in the disconnect box assembly of the strut system can cause contamination and hydrogen embrittlement of the titanium structure resulting in cracks that can compromise the engine firewall by allowing a fire in the engine area to enter the strut; or by allowing flammable fluids to leak down and initiate an engine fire in the engine core cavity compartment, and also compromise the engine fire extinguishing system. Hydraulic fluid contamination, including contamination caused by hydraulic fluid in its liquid, vapor, and/or solid (i.e., coked) form, in the strut forward dry bay can lead to hydrogen embrittlement of the titanium fittings of the forward engine mount bulkhead and also the consequent inability of the fittings to carry engine loads, resulting in the loss or separation of an engine. Hydraulic embrittlement could also cause a through-crack formation across the fittings through which an engine fire could breach into the strut, resulting in an uncontained strut fire. We are proposing this AD to detect and correct blockage of forward strut drain lines, which could cause flammable fluids to collect in the forward strut area and potentially cause an uncontrolled fire or cause failure of engine attachment structure and consequent airplane loss.

### **Related Rulemaking**

On May 24, 2013, we issued AD 2013-11-14, Amendment 39-17474 (78 FR 35749, June 14, 2013), for certain The Boeing Company Model 777-200 and -300 series airplanes. AD 2013-11-14 currently requires repetitive general visual inspections of the strut forward dry bay for hydraulic fluid contamination, and related investigative and corrective actions if necessary. AD 2013-11-14 was prompted by reports of hydraulic fluid contamination found in the strut forward dry bay. The actions required by

AD 2013-11-14 are intended to detect and correct hydraulic fluid contamination of the strut forward dry bay that could result in hydrogen embrittlement of the titanium forward engine mount bulkhead fittings, and the consequent inability of the fittings to carry engine loads, resulting in engine separation.

On April 12, 2011, we issued AD 2011-09-11, Amendment 39-16673 (76 FR 24354, May 2, 2011), for certain The Boeing Company Model 777-200 and -300 series airplanes. AD 2011-09-11 requires repetitive inspections for hydraulic fluid contamination of the interior of the strut disconnect assembly; repetitive inspections for discrepancies of the interior of the strut disconnect assembly, if necessary; repetitive inspections of the exterior of the strut disconnect assembly for cracks, if necessary; corrective action if necessary; and an optional terminating action for the inspections. AD 2011-09-11 resulted from reports of system disconnect boxes that have been contaminated with hydraulic fluid and, in one incident, led to subsequent cracking of titanium parts in the system disconnect assembly. We issued AD 2011-09-11 to detect and correct hydraulic fluid contamination, which can cause cracking of titanium parts in the system disconnect assembly, resulting in compromise of the engine firewall.

#### **Relevant Service Information**

We reviewed Boeing Special Attention Service Bulletin 777-54-0027, Revision 1, dated September 12, 2013. For information on the procedures and compliance times, see this service information at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2014-0523.

#### **FAA's Determination**

We are proposing this AD because we evaluated all the relevant information and determined the unsafe condition described previously is likely to exist or develop in other products of this same type design.

## Proposed AD Requirements

This AD would require repetitive functional checks for blockage of the forward strut drain line, doing corrective actions (including cleaning or replacing any blocked drain lines) if necessary; and a one-time cleaning of certain forward strut drain lines. This proposed AD would require accomplishing the actions specified in the service information described previously.

The phrase “corrective actions” is used in this proposed AD. “Corrective actions” are actions that correct or address any condition found. Corrective actions in an AD could include, for example, repairs.

## Interim Action

We consider this proposed AD interim action. The manufacturer is currently developing a modification that will address the unsafe condition identified in this AD. Once this modification is developed, approved, and available, we might consider additional rulemaking.

## Costs of Compliance

We estimate that this proposed AD affects 54 airplanes of U.S. registry.

We estimate the following costs to comply with this proposed AD:

### Estimated costs

| Action  | Labor cost  | Parts cost | Cost per product           | Cost on U.S. operators        |
|---|---|------------|----------------------------|-------------------------------|
| Repetitive functional checks of 2 struts per inspection cycle | 9 work-hours X \$85 per hour = \$765 per inspection cycle | \$0        | \$765 per inspection cycle | \$41,310 per inspection cycle |
| One-time cleaning   | 13 work-hours X \$85 per hour = \$1,105                   | \$0        | \$1,105                    | \$59,670                      |

We estimate the following costs to do any necessary replacements that would be required based on the results of the proposed inspection. We have no way of determining the number of aircraft that might need these replacements:

**On-condition costs**

| <b>Action</b>  | <b>Labor cost</b>                             | <b>Parts cost</b> | <b>Cost per product</b> |
|--|---|-------------------|-------------------------|
| Clean and repair drain tube assemblies in up to 2 struts | Up to 5 work-hours X<br>\$85 per hour = \$425 | \$0               | Up to \$425             |
| Replace drain tube assemblies in up to 2 struts          | Up to 5 work-hours X<br>\$85 per hour = \$425 | Up to<br>\$4,484  | Up to<br>\$4,909        |

According to the manufacturer, some of the costs of this proposed AD may be covered under warranty, thereby reducing the cost impact on affected individuals. We do not control warranty coverage for affected individuals. As a result, we have included all costs in our cost estimate.

**Authority for this Rulemaking**

Title 49 of the United States Code specifies the FAA’s authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency’s authority.

We are issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: “General requirements.” Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This proposed regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

## **Regulatory Findings**

We determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify this proposed regulation:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Is not a “significant rule” under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979),
- (3) Will not affect intrastate aviation in Alaska, and
- (4) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

## **List of Subjects in 14 CFR Part 39**

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

## **The Proposed Amendment**

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

### **PART 39 - AIRWORTHINESS DIRECTIVES**

- 1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

#### **§ 39.13 [Amended]**

- 2. The FAA amends § 39.13 by adding the following new airworthiness directive (AD):

**The Boeing Company:** Docket No. FAA-2014-0523; Directorate Identifier 2014-NM-050-AD.



**(a) Comments Due Date**

We must receive comments by **[INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

**(b) Affected ADs**

None.

**(c) Applicability**

This AD applies to The Boeing Company Model 777-200 and -300 series airplanes, certificated in any category, equipped with Pratt & Whitney engines, as identified in Boeing Special Attention Service Bulletin 777-54-0027, Revision 1, dated September 12, 2013.

**(d) Subject**

Air Transport Association (ATA) of America Code 54, Nacelles/pylons.

**(e) Unsafe Condition**

This AD was prompted by reports of blocked drain lines at the engine forward strut that caused flammable fluid to accumulate in a flammable leakage zone. We are proposing this AD to detect and correct blockage of forward strut drain lines, which could cause flammable fluids to collect in the forward strut area and potentially cause an uncontrolled fire or cause failure of engine attachment structure and consequent airplane loss.

**(f) Compliance**

Comply with this AD within the compliance times specified, unless already done.

**(g) Functional Check, Cleaning, and Corrective Actions**

At the applicable times specified in paragraph 1.E., “Compliance,” of Boeing Special Attention Service Bulletin 777-54-0027, Revision 1, dated September 12, 2013, except as provided by paragraph (h) of this AD, do the actions specified in paragraphs (g)(1) and (g)(2) of this AD, in accordance with the Accomplishment Instructions of Boeing Special Attention Service Bulletin 777-54-0027, Revision 1, dated September 12, 2013. Repeat the functional check required by paragraph (g)(1) of this AD, thereafter at the applicable times specified in paragraph 1.E., “Compliance,” of Boeing Special Attention Service Bulletin 777-54-0027, Revision 1, dated September 12, 2013.

(1) Do a functional check for blockage of the forward strut drain line of the left and right strut, clean the forward strut drain line, and do all applicable corrective actions (including cleaning or replacing blocked drain tubes, repairing water leaks, and cleaning the inlet drain screen on the right system disconnect assembly inlet). Do all applicable corrective actions before further flight.

(2) Do a one-time cleaning of the smaller forward strut drain lines connected to the left systems disconnect, the strut forward lower spar, and the forward fire seal pan inlets.

**(h) Exception to the Service Information**

Where Boeing Special Attention Service Bulletin 777-54-0027, Revision 1, dated September 12, 2013, refers to a compliance time “after the Revision 1 date of this Service Bulletin,” this AD requires compliance within the specified compliance time after the effective date of this AD.

**(i) Alternative Methods of Compliance (AMOCs)**

(1) The Manager, Seattle Aircraft Certification Office (ACO), FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the ACO, send it to the attention of the person identified in paragraph (j)(1) of this AD. Information may be emailed to: 9-ANM-Seattle-ACO-AMOC-Requests@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(3) An AMOC that provides an acceptable level of safety may be used for any repair required by this AD if it is approved by the Boeing Commercial Airplanes Organization Designation Authorization (ODA) that has been authorized by the Manager, Seattle ACO, to make those findings. For a repair method to be approved, the repair must meet the certification basis of the airplane, and the approval must specifically refer to this AD.

**(j) Related Information**

(1) For more information about this AD, contact Kevin Nguyen, Aerospace Engineer, Propulsion Branch, ANM-140S, FAA, Seattle Aircraft Certification Office, 1601 Lind Avenue SW., Renton, WA 98057-3356; phone: 425-917-6501; fax: 425-917-6590; email: kevin.nguyen@faa.gov.

(2) For service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Data & Services Management, P. O. Box 3707, MC 2H-65, Seattle, WA 98124-2207; telephone 206-544-5000, extension 1; fax 206-766-5680; Internet <https://www.myboeingfleet.com>. You may view this referenced service information at the FAA, Transport Airplane Directorate, 1601 Lind Avenue SW., Renton, WA. For information on the availability of this material at the FAA, call 425-227-1221.

Issued in Renton, Washington, on July 30, 2014.

**Jeffrey E. Duven,**  
*Manager,*  
*Transport Airplane Directorate,*  
*Aircraft Certification Service.*

**BILLING CODE 4910-13-P**

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